

**RELAYS**  
**KS-6902, KS-6903 AND KS-7252**  
**REQUIREMENTS AND ADJUSTING PROCEDURES**

**1. GENERAL**

1.01 This section covers KS-6902 and KS-6903 relays and replaces Section A462.007, provisional issue 1.

1.02 This section is reissued to incorporate material from the addendum in its proper location. In this process marginal arrows have been omitted.

1.03 Reference shall be made to Section 020-010-711 covering General Requirements and Definitions for additional information necessary for the proper application of the requirements listed herein.

1.04 Part 1, "General" and Part 2, "Requirements" form part of the Western Electric Co. Inc. Installation Department handbook.

1.05 Operate means that when the operate current is applied, the armatures shall move until at least one of the stop pins on each armature touches the core and all normally open contacts are made reliably.

1.06 Release means that when the current is reduced from the operate value to the release value, the armatures shall move from the operated position sufficiently to break the contacts that have been made.

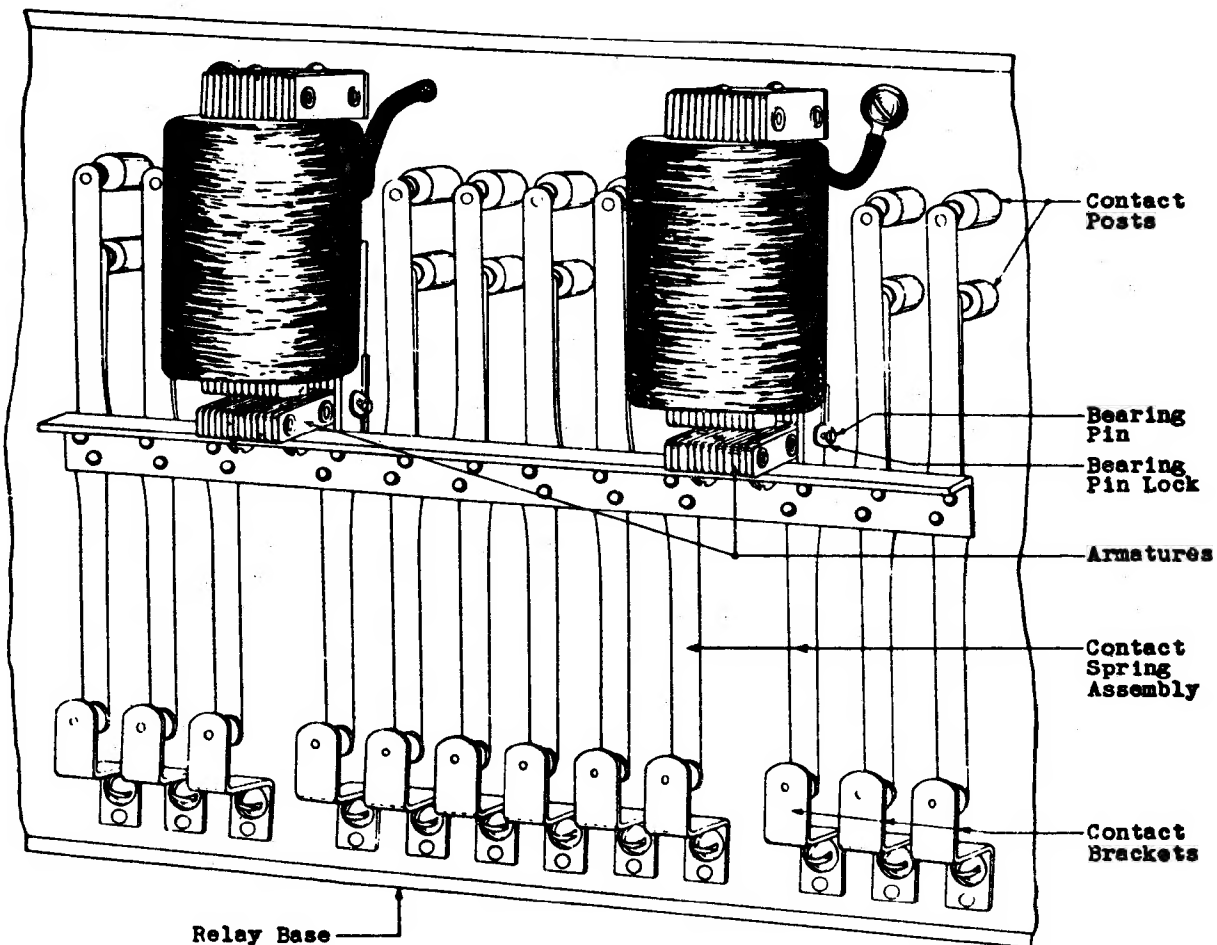


Fig. 1

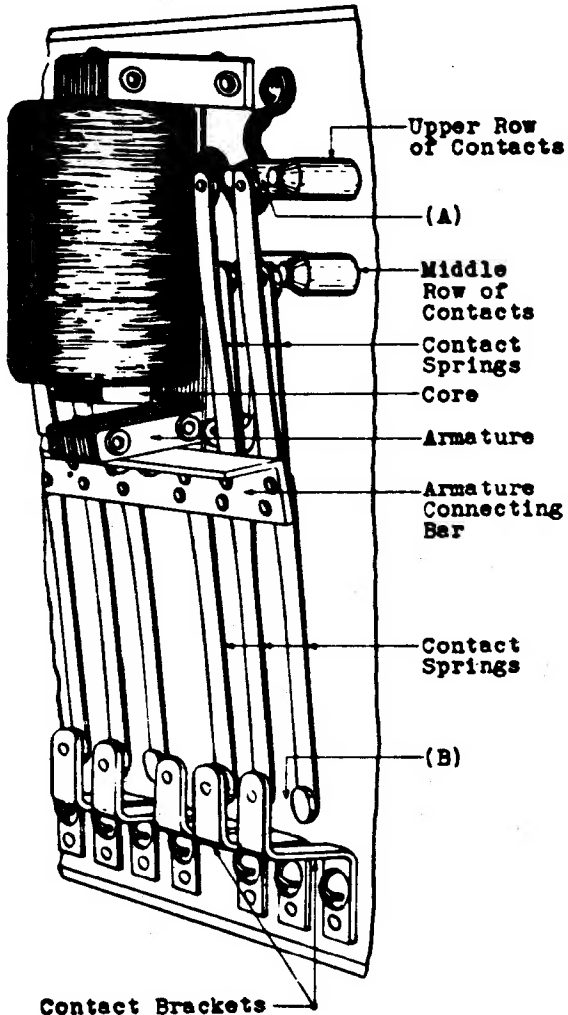


Fig. 2

## 2. REQUIREMENTS

### 2.01 Cleaning

(a) The contacts shall be cleaned when necessary in accordance with the section covering cleaning of relay contacts and parts.

(b) Other parts shall be cleaned when necessary in accordance with approved procedures.

2.02 Relay Mounting The relay shall be fastened securely to its mounting. Gauge by feel.

### 2.03 Tightness of Assembly

(a) The coils, contact posts and contact brackets shall be fastened securely to the relay base. Gauge by feel.

(b) The contact spring assembly shall be fastened securely to the armatures. Gauge by feel.

2.04 Armature Movement The armatures shall move freely in their bearings. Gauge by feel.

2.05 Contact Separation - Fig. 2 (A) and (B)  
With the relay in its normal position of rest, the separation between any pair of contacts shall be

Min. .040"

Use the No. 87-A gauge.

2.06 Contact Pressure With the relay in the operated position, the contact pressure shall be

Min. 15 grams

Use the No. 79-C gauge.

### 2.07 Contact Sequence

(a) For KS-6902 and KS-6903 relays the middle row of contacts shall make before the upper row of contacts make. (See Fig. 2)

(b) For KS-7252 relays, the contacts in the second row shall make before the corresponding contacts in the first row make. (See Fig. 6 (A)).

Gauge by eye.

2.08 Electrical Requirements A relay shall meet the electrical requirements specified on the circuit requirement table.

**3. ADJUSTING PROCEDURES****3.001 List of Tools, Gauges, Materials and Test Apparatus**

<u>Code No.</u>	<u>Description</u>
<u>Tools</u>	
209	Wrench - 5/16" Hex. Open End Offset
303	Spring Adjuster
-	Bell System P-Long Nose Pliers 6-1/2" per A.T.&T. Co. Drawing 46-X-56
-	Bell System Cabinet Screw-driver 3-1/2" per A.T.&T. Co. Drawing 46-X-40
-	Bell System Regular Screw-driver 4" per A.T.&T. Co. Drawing 46-X-34
<u>Gauges</u>	
79-C	0-200 Gram Push-Pull Tension Gauge
87-A	.022" and .040" Double-End Thickness Gauge
<u>Materials</u>	
KS-2423	Cloth
KS-6232	Oil
KS-7860	Petroleum Spirits
-	Toothpicks, Hardwood Flat at One End and Pointed at the Other
<u>Test Apparatus</u>	
35-C	Test Set

**3.01 Cleaning (Rq.2.01)**

M-1 Clean the contacts in accordance with the section covering cleaning of relay contacts and parts.

M-2 Clean other parts as outlined in procedure 3.04.

**3.02 Relay Mounting (Rq.2.02)**

M-1 To tighten loose mounting screws use the 4" regular screw-driver.

**3.03 Tightness of Assembly (Rq.2.03)**

M-1 If the coils or lower row of contact posts are not fastened securely to

the relay base, tighten the screws with the 4" regular screw-driver.

M-2 If the contact brackets are not fastened securely to the relay base, tighten the screws with the 4" regular screw-driver holding the lock nuts with the No. 209 wrench.

M-3 If the upper row of contacts posts are not fastened securely to the relay base, tighten the screws with the 3-1/2" cabinet screw-driver and then tighten the lock nuts with the No. 209 wrench.

M-4 If the contact spring assembly is not fastened securely to the armatures, tighten the screws with the 3-1/2" cabinet screw-driver.

**3.04 Armature Movement (Rq.2.04)**

M-1 If the armature fails to move freely in its bearings, remove the bearing pin locks with the long nose pliers as shown in Fig. 3.

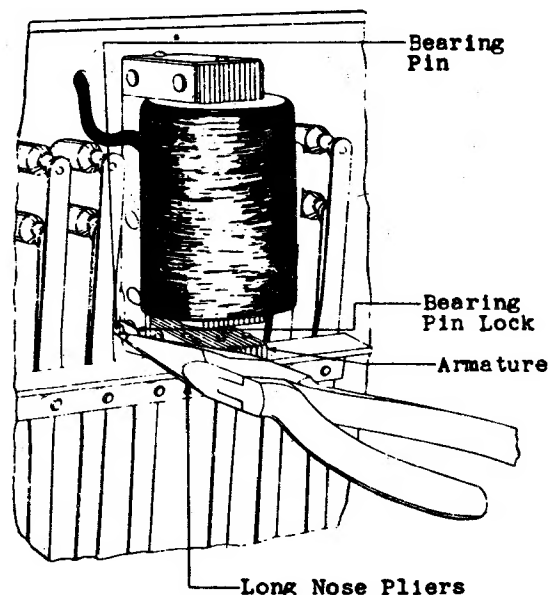


Fig. 3 - Method of Removing Bearing Pin Locks

Remove the bearing pins with the long nose pliers. Wipe the bearing pins with a clean dry KS-2423 cloth removing all gummy substance. Then lubricate the pin sparingly with KS-6232 oil and wipe it off again with the cloth. Remove the armature and contact spring assembly and clean the armature bearing surfaces by means of a toothpick which has been dipped in petroleum spirits. Do not use the same toothpick for more than one cleaning operation. When the armature bearing

surfaces are thoroughly dry, replace the armature and contact spring assembly. Then replace the bearing pins and the bearing pin locks with the long nose pliers.

- 3.05 Contact Separation (Rq.2.05)
- 3.06 Contact Pressure (Rq.2.06)
- 3.07 Contact Sequence (Rq.2.07)
- 3.08 Electrical Requirements (Rq.2.08)

**M-1 General** In connection with contact pressures, note that they are specified on a minimum basis. They have however a direct bearing on the electrical requirements for the relay since if the pressures are greatly in excess of their minimum tension the relay may fail to meet its electrical requirements in which case it will be necessary to reduce the spring tension toward the specified minimum. In readjusting however, it is desirable to have as much tension as possible on the various springs in order to be consistent with meeting other requirements. In adjusting the springs, tension the springs approximately equal.

**M-2 Contact Separation** If the contact separation is not satisfactory, adjust the springs at fault close to the point where they are riveted to the armature connecting bar using the No. 303 spring adjuster.

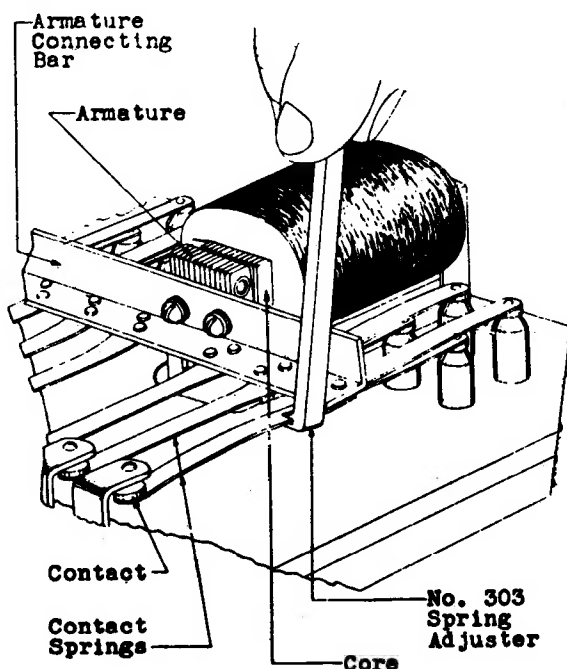


Fig. 4 - Method of Adjusting For Contact Pressure

**M-3 Contact Pressure** If the contact springs do not have sufficient tension against the contacts hold the armature connecting bar so that the armatures rest against the back stops. Increase the tension of the springs by adjusting them toward the contacts using the No. 303 spring adjuster applied close to the point where the springs are riveted to the armature connecting bar as shown in Fig. 4. In adjusting the springs exercise care not to twist them since this will prevent the contacts from resting flat against each other.

**M-4 Contact Sequence** To adjust for contact sequence increase or decrease the contact separation as required with the No. 303 spring adjuster applied to the spring at fault close to the armature connecting bar. After adjusting for contact sequence recheck for contact separation and contact pressure. In adjusting the springs take care not to kink them. Do not straighten kinked springs unless the kink interferes with the proper adjustment of the relay. Removing kinks tends to weaken the spring and shorten the life of the relay.

**M-5 Electrical Requirements** If the relay fails to meet its electrical requirements it may be due to the armatures being set too far from the cores or due to incorrect contact pressure.

**M-6 Operate** If the armatures do not move toward the cores when the operate current is applied, the air-gaps between the armatures and the cores are excessive. Remove the armature and contact spring assembly as outlined in procedure

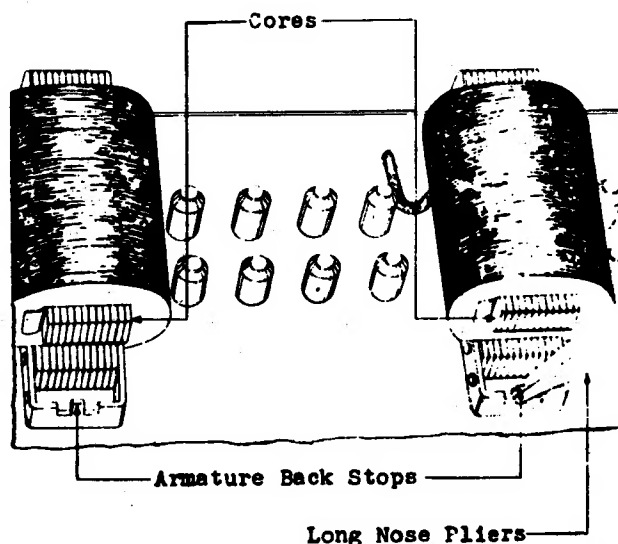


Fig. 5 - Method of Adjusting Armature Back Stops

3.04. Adjust the armature back stops slightly toward the cores with the long nose pliers as shown in Fig. 5. Replace the armature and contact spring assembly as outlined in procedure 3.04. If the armatures still do not move toward the cores when the operate current is applied, repeat this adjustment until it does.

M-7 If the armatures move toward the core when the operate current is applied but do not move to the fully operated position, it is an indication of excessive contact pressure. Reduce the contact pressure slightly by adjusting the springs away from the contacts using the No. 303 spring adjuster applied close to the point where the springs are riveted to the armature connecting bar. Exercise care not to change the contact sequence.

M-8 Release If the relay fails to meet its release requirement, it is an indication of insufficient contact pressure. Increase the contact pressure slightly as outlined in M-3 exercising care that the operate requirement is still met.

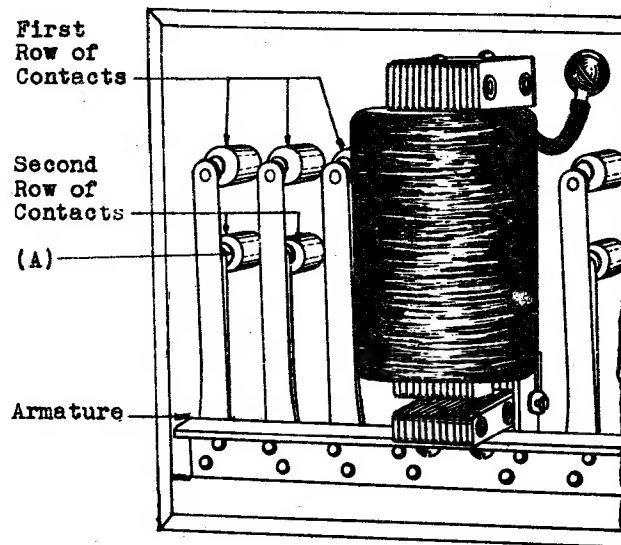


Fig. 6 - KS-7252 Relay